INNOVATIVE LEARNING

Case: HAMK University of Applied Sciences

HAMK
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Bachelor's Thesis

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ABSTRACT

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ABSTRACT

The study was set out for the International Business faculty of HAMK University of Applied Sciences in Valkeakoski Campus. HAMK is a state-recognized multidisciplinary higher education institution with seven different campuses over southern Finland. It is an innovative institution which offers bachelor and master degree programs in six major disciplines.

The primary purpose of the study is to determine ways in which HAMK's international business students could improve innovation in their daily studies and to find out innovative learning methods which could be effective while simultaneously appropriate to apply throughout the entire study period. The study is well structured with clear objectives; *identify new innovative methods of studying*, *analyzed the proposed innovative techniques*, [*discuss*] *learning environment in HAMK*, and *conclusions*. The study serves to fulfill its main intention with theoretical literatures from various innovative pedagogies and diverse responses from the international business students of two separate year groups. Also, some research methods were used to achieve the objectives like; *collecting relevant theoretical data about the thesis topic from numerous resources*, *giving out survey questionnaires*, *thoroughly studying all the resources*, and *delivering the processes*, *outcomes*, and *challenges*.

The results of the study reveal the need to change three main areas of the international business faculty; *teaching techniques*, *learning resources*, and *learning lifestyle*.

The conclusion drawn was that HAMK need to critically review its learning processes and seriously consider the changes insisted by the students in order to improve innovation within its whole study environment and at the same time inspire students to successful accomplish their academic goals.

Keywords Innovative Learning, Innovative Approaches to Learning, Innovation.

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1 INTRODUCTION

The controversy that education necessarily needs development in adapting to the study demands of a future that stands ambiguous has been intensely re-enacted. Despite the fact that there is a substantial argument for the intensity and seriousness of the matter and the kinds of developments in pedagogy, educational programs, and the evaluations required, there is still an increasing unanimity that education systems that are exceptionally developed are rarely to be qualified the kind of action change that is crucially necessary.

Circumstantial variations signify that these debates turn out rather differently across the globe. In high-quality education systems such as Finland and South Korea, the pressure to examine possible choices of the conventional style of coordinated study in improving the norms of achievement is not felt severely compared to places like the United States, where systems are progressing with difficulties.

Schools are the influential tool for establishing education everywhere in the world, and the challenge to the current standard of learning is so certain. In the less developed world, some education innovators are investigating the actual belief of schools being the proper (or the exclusive) explanation to the question of educating their children.

Nevertheless, this writing serves to evoke improvements on innovative learning in HAMK University of Applied Sciences particularly with the International Business faculty in Valkeakoski Unit.

1.1 Company Information

Häme University of Applied Sciences (HAMK) is a state-recognized multidisciplinary higher education institution that has seven different campuses around southern Finland with relatively 7,000 students and 750 staff members. The university provides both bachelor and master degree programs in six main disciplines;

1. Natural Sciences
2. Natural Resources and the Environment
3. Social Services, Health and Sport
4. Social Sciences, Business and Administration
5. Culture
6. Technology, Communication and Transport.

Four of the disciplines in the bachelor program, namely, *Electrical and Automation Engineering*; *Construction Engineering*; *International Business*; and *Mechanical Engineering and Production Technology* are instructed in English.

HAMK is an innovative institution in that it offers broad-based, high-quality education, research and development, and strong internalization. The curriculum in all its disciplines consists of basic and professional studies, optional studies, a work placement period, as well as a thesis. Not only that, but HAMK also allows for professional teacher education, research and development services, and ongoing education and studies with the Open University of Applied Sciences in Finland.

This study, however, focuses only on the International Business (IB) faculty of HAMK, in Valkeakoski campus. As typical of the overall HAMK institution, the international business faculty also upholds strong internationalization with a number of international endeavors which involve studying abroad (Erasmus Exchange Program/Double Degree Program), research and development projects, and opportunities for mobility. The faculty's learning atmosphere includes the network-based library and reliable information services. Also, there are development projects that allow students to practically learn real-life matters in completing their theses, as well as high chances in setting up their own company.

Basically, the international business faculty's quality system comprises of a number of proceedings, programs, and methods that upholds quality management while giving directions for its staff members during their work performance in correspondence with mutually acknowledged strategies, objectives, and words. The international business program offers a Bachelor's degree in Business Administration (BBA) and is conducted in English, with staff members of diverse nationalities.

HAMK retains a quality system fundamentally grounded on regular upgrades that embody all activities and organizational positions, including students.

1.2 Purpose and Objectives

Recently, there have been some changes in HAMK's curriculum and the study system, which poses a few questions that were later narrowed down to being the research question.

How to enhance innovation in studies?

This key question surfaced mainly towards the international business students in the Valkeakoski campus since they are affected by these changes and HAMK would like to find out how its students could boost innovation in their everyday learning.

Also, to identify and appreciate the improved innovative study approaches that can be effective and at the same time convenient to apply during a study period and to create a conducive and motivating learning environment within HAMK, Valkeakoski campus.

In answering the research question, the thesis is outlined in a distinct structure with a clear set of objectives as listed hereafter.

1. Identify new innovative methods of studying
2. Analyse the proposed innovative techniques
3. [Discuss] Learning Environment in HAMK –Valkeakoski Unit
4. Conclusions

This writing is further divided into four (4) main sections that also include a few sub-sections:

1. Introduction
   Consists of general information about the topic, important background information about the case company, the research purpose and objectives, and the methods in which the research was conducted.

2. Theory
   Focuses on the theoretical data concerning innovative pedagogy, developing an innovative ecosystem for education, innovative learning, and the main aspects and issues surrounding these innovation topics.

3. Discussion
   Examines the present study situation of the international business field of study in HAMK, analyse the findings of the topic that was gathered through survey questionnaires and research.

4. Conclusion
   Sums up the whole research and report based on all the findings, and perhaps give additional recommendations.

1.3 Methods

The research question and the objectives would not be properly answered had there been none of the following appropriate ways of managing them:

- Gathering useful theoretical data concerning the thesis topic from various helpful resources such as books from the library, online journals, published articles online, and websites.

- Handing out survey questionnaires to international business students from the respective years - BNI12&14.

- Carefully studying all the resources, especially to understand the concepts and issues in order to properly explain and pertain them to the case company's current situation.

- Delivering the processes, challenges, and outcomes along the way while seeking further advice on ways to effectively conduct the research and writing as a whole.

This thesis has utilized various theories taken from different authors' work; therefore, it is not based solely on a book or perception. Also, survey questionnaires were created in a way that students could give constructive and relevant answers that are greatly needed to achieve the purpose and objectives of this report. These questions are fundamentally pertaining to the thesis topic and the research question.

2 IDENTIFYING INNOVATIVE METHODS OF STUDYING

All the data illustrated throughout this writing are grounded on the work of various innovators, experts, authors, and bloggers. It covers comprehensive knowledge and facts about the specific thesis topic, the challenges of improving and achieving high-quality innovative learning, and incentives for enhancing innovative learning approaches.

This section of writing acknowledges and uncovers the thesis topic and is also the fundamental explanation to the research question in accomplishing the objectives, notably towards the international business discipline of HAMK, Valkeakoski unit.

2.1 Innovation

''Successful innovation is the creation and implementation of new processes, products, services and methods of delivery which result in significant improvements in outcome efficiency, effectiveness or quality.''
(Mulgan & Albury: 2003)

Over the past centuries, innovation has been progressively considered being a central determinant to sustain competitiveness within globalized economies. Innovation can bring new ideas and energy into passive and dormant markets as well as functioning like a vehicle to strengthen any organization's capability to accommodate the changing surroundings. Innovation theory and policies have primarily concentrated on the business sector. Businesses have to innovate to remain in the game through receiving latest products and/or services, developing their capability of their production operations and organizational structures, or improving the marketing of their enterprises so that their survival can be assured.

Recently, policy interest has broadened this ''innovative imperative'' from private institutions to the plan belonging to public services. Despite the fact that public services, including education, rarely perform in competitive markets or carry equal motivation to innovate just like businesses do, there are substantial debates to involve innovation in education as a medium to inflate the cost of public investment.

2.2 Describing Innovation in Education

Statistically, the most commonly recognized definition of innovation derives from the Oslo Manual (OECD/Eurostat: 2005). It describes innovation as ‘’the implementation of a new or significantly improved product (good or services) or process, a new marketing style, or a new organizational technique in business practices, workplace organization or external relations.’’ (OECD: 2014) In this definition, ‘’implementation’’ specifically pertains to the introduction of a commodity to the market, at the same time it involves the physical practices of operations, marketing techniques, and organizational systems. The usage of the word ‘’new’’ implies that innovation holds a magnitude of newness on the standard of the organization, market, and the world.

The private sector, as well as education with small-scale alterations, has generally put into use this definition. Educational institutions (like schools, universities, training centers, and educational publishers) have made known the following;

- latest products and services – e.g. new syllabi, course books, and learning resources
- modern systems for communicating their services – e.g. ICT being used in e-learning services
- latest methods of arranging their tasks – e.g. ICT to correspond with students and parents
- improved marketing approaches – e.g. numerical valuation of postgraduate courses

These recent systems are determined to better the strategy of education in any way, thus, innovations in education should be considered as ‘’improvements.’’ (OECD: 2014)

Nonetheless, the concept of ‘’improvement’’ in a good number of public services, including education, can be ambiguous and the application of this definition has been questioned. The understanding of improvement revolves around the viewpoint of the stakeholders who perhaps poses differently as a consumer, citizen, and taxpayer. Evaluating the favorable outcome of firms within the private sector by revenue, sales or growth is broadly recognized: whatsoever their aspirations, eventually they have a specific essence that succeeds their other purposes. In contrast, either public organizations remain in business or out of business, is normally restrained to a political agreement instead of a market authorization. Public organizations are evaluated according to a variety of goals like increased quality, equity, coverage and efficiency that are insignificantly proportional and may still be at odds.

Subsequently, improvements in education can be understood variously relying on which goal is investigated or on the perspective of the observer. Also, cultural beliefs, social procedures, and political objectives can provoke conflicting prioritization of these various goals across the nations. Prioritization can adjust over time because of changes in situations and na-

tional's beliefs. This has results for the effectiveness and restraints of the data collected.

This indicates that, ideally, innovation signs within the education sector should be connected to particular social and educational goals, for example, learning outcomes, cost efficiency, fairness, and public satisfaction. It should also be determined at separate stages, and when they cannot be detached, determine based on separate stakeholder's views. (OECD: 2014)

2.3 Innovation in Education System

How could education system gain quality by innovation?

Firstly, innovations in education can boost learning effects at the same time the excellence of education plan. For instance, the educational operation can be greatly personalized through the modification in pedagogies or the educational system. Latest styles in customized study depend massively on modern school institutions and the practice of information and communication technologies.

Furthermore, education is recognized in nearly all countries being a channel to reinforce equity and equality. Innovations could assist to enhance equity in approaching and utilizing education, also equality through the learning effects.

Additionally, like businesses, public institutions are frequently pressured to increase efficiency, decrease costs, and maximize the value for money. Mulgan and Albury (2003) debate that there has been an inclination for expenses in every public service in order to rapidly improve than the others in the economy, and education is inclusive. Although this could be associated with Baumol's cost disease, (that is, the kind of public service plan that experiences ever increasing labor costs and inadequate breadth for life-changing production growths), this also perhaps because of the need to innovate. Innovation, therefore, is perceived being an incentive for further productive provision of these services.

Lastly, education should stay consistent despite accelerated adjustments to society and the national economy. As a result, the education sector should propose the urgent adjustments that sanction it to accommodate societal expectations. For instance, education operations encounter an urgency to accept teaching, learning, or organizational processes that have been singled out as profitable to promoting ''skills for innovation.''

2.4 Innovative Methods to Learning

Scardamalia and Bereiter (OECD, 2008) and Van Den Broek (OECD, 2012) have analyzed methods towards learning that begin barely with a specific knowledge and further with specific discoveries from learning research that have been drawn-out into ideal use. They outlined these methods into the classifications hereunder.

- Fostering Communities of Learning is a constructivist method in that teachers provide assistance for students in uncovering relevant curricular theories enclosed by the student's individual interpretation and queries. Study patterns revolve around learning through uncovering and notably emphasize cooperative learning, for instance, by alternate student-student teaching in miscellaneous groups.

- Learning by Design is a research-based science learning curriculum founded case-based analytical designs that illustrate how study exercises can be formed in a certain way that students create events with which they can select afterward while solving the problem.

- The Neo-Piagetian Central Conceptual Structures (CCS) Theory characterizes preliminary alteration in children's reasoning and the types of involvement that are crucial to proceed to further upgraded advancing level in distinct logical spheres, like space and numeric understanding.

- Web-based Inquiry Science Environment (WISE) is an internet-based flexible study setting where standards of intelligence integration are being exercised at the time of online collective science researches. The intelligence integration outlook expresses how children manage numerous opposing perspectives of scientific development.

- Cognitive Tutors are knowledgeable flexible software programs that offer students constructed direction, evaluation and support by responding to their performance. Performance is examined and determined by likening present student conduct to ACT-R models (Anderson, Corbett, et al., 1995) of conventional study courses that are drawn up according to consecutive sub-goals and manufacture guidelines.

- Direct Instruction is purposely to develop and stimulate study through understandable and to-the-point scripted straightforward direction by the teacher with high rates of student achievement in the framed exercise targeted at the dynamic engagement of every student with low errors.

- Higher Order Thinking Skills (HOTS) is targeted specifically towards the impaired students in that they participate in Socratic discussions about objectives and plans of actions to resolve game-based issues on the computer. It is intended to supply students with comprehensive exercise to use and verbalize main accepted reasoning competency, for example, meta-cognitive and drawing conclusion.

- Knowledge Building is a constructivist teaching method that sets a compelling significance on the initiation of community awareness as the source behind operations.

All eight of these different methods differ in light of directedness; stress more on concepts versus exercises; as well as individual versus society importance. These methods outlined above are built on designs belonging to learning structures. Part of the designs defines what theories and approaches pupils will learn; the rest further concentrate on methods in which pupils attain ideas and improve competencies with regards to instructions; also about typical challenges while learning practices to beat these challenges.

2.5 Analyzing the Proposed Innovative Techniques

Now that the most effective and innovative approaches toward learning are identified, it is fitting to continue on to analysing them. These analyses would essentially make clear the different processes and techniques of enhancing education which includes what group of students are suitable for what methods.

2.5.1 Fostering Communities of Learning

As mentioned earlier, fostering communities of learning is a constructivist method style which accentuates democratic, student-focused and research-based instruction aligned toward the development of more advanced insight with the help of aggregated, authentic assignments, cooperative scientific research, and complementary teaching.

Fostering communities of learning was established during the early 1990s when a research project to the review of education ''in the blooming, buzzing distraction of inner-city classrooms'' (Brown; 1992) was conducted by two committed individuals; Ann Brown and John Campione from Berkeley University. They began with the standards of learning which were distinct and understandable to direct action so that pedagogical approaches could be accepted based on those principles instead of merely visible action (Brown; 1994). This practice is frequently identified with the source of current design-based study where educational innovations are repetitively proven and polished in actual classrooms (Barab; 2006).

Theoretically, fostering communities of learning strengthens a significant scope on the Vygotskian notion of a *zone of proximal development*, along with ideas by different authors which Brown and Campione (1994) identified as ''region of sensitivity to instruction'', ''readiness area'', or ''bandwidth of competence''. In this framework, the *zone of proximal development* is interpreted as the difference between what individual learners can do or comprehend respectively, and what they can accomplish with the assistance of a more proficient peer or adult (refer figure 1). Particularly, it implies the distance between the standard of knowledge a learner can attain independently, and the standard which he can possibly attain under qualified supervision. The objective of study exercises in the *zone of proximal development* is that the student grasps the importance of becoming independently versed with assignments which he can only at first achieve with assistance.

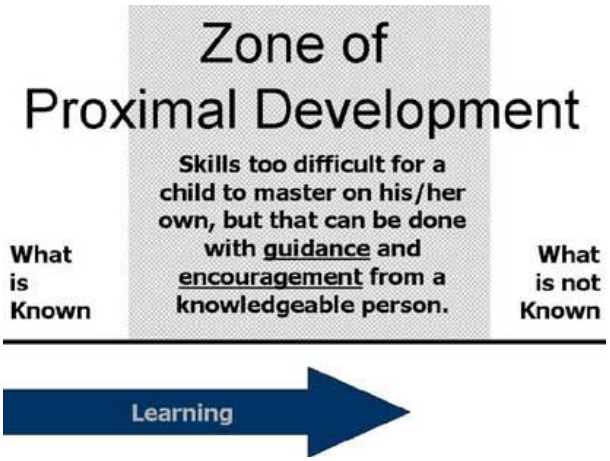

Figure 1 Graphical Illustration of the Zone of Proximal Development[1]

Lev Vygotsky believes that a valuable technique for cultivating competencies and strategies is synergy with peers. He proposes that teachers exercise reciprocal study activities in which less proficient student progress merely with support from more proficient peers; within the zone of proximal development.

Vygotsky also trusts that by giving relevant help when a student is within the zone of proximal development for a specific assignment will encourage the student to complete it.

Fostering communities of learning stresses that teacher's duty is to steer the discovery process of the student toward the superior bounds of their ground of improvement. This is a challenging duty since the teacher needs to direct the study experiences of the student with a sound knowledge concerning when to interfere and when to allow students resolve problems individually. Thus, teachers must possess an advantageous recognition of an individual student's zone of proximal development.to steer the students toward types of question which they would not attain without assistance. Teachers separately carry out their own interpretation of 'fostering communities of learning' in order that there is an extensive variability within various classes.

Still, certain aspects of outstanding classrooms need to be performing for 'fostering communities of learning' in order to be aptly determined. These significant aspects of 'fostering communities of learning' classrooms are; (Van Den Broek. G; 2012).

1. Individual Responsibility Coupled with Communal Sharing
   Knowledge is shared purposely across the individuals of the learning communities and distributed in cooperative learning exercises. The group brings to light accordingly which characteristics of expertise require more research and each student be responsible for further determining and teaching this expertise to the rest. The students can concentrate (''major'') on a specific subject when they are specifically overwhelmed by it.

2. Multiple Zones of Proximal Development
   There is a priority on requested diversity in the classroom since the heart of teamwork is to combine types of knowledge. As reported by Brown and Campione, there is limited (scientific) assistance for the concept that a prototypical type of development occurs which defines when precisely ‘’normal’’ students are prepared to study specific expertise.

3. Ritual, Familiar Participant Structures
   There are several participation structures which are exercised regularly. The repetitious character of these exercises allows students to cause the changeover from one exercise to another promptly and efficiently while assisting them to recognize what their task is in each exercise.

4. A Community of Discourse
   A community of discourse needs to be set up at the beginning, where constructive discussion, examination and assessment become the authoritative standard. Discussion exercises implicate progressively scientific modes of thinking, in order that students can grasp and use a hypothesis, conjecture, evidence, and validation. The academic argument for this significance on an intense exchange of discourse is that higher understanding is perceived as internalized conversation. Thus, every individual of the class is reassured to take up a discourse framework, objectives, and principle structures of the community.

5. Seeding, Migration, and Appropriation of Ideas
   Students of all ages, including teachers, construct zones of proximal development by seeding the setting with ideas and perceptions. Ideas can then grow within the community, migrate to other individuals, and endure over time. Other individuals might appropriate the ideas and perceptions, amend and expand them, decipher and reconstruct them, with regards to their demands as well as to the present situation of the zone of proximal development in which they are involved. Practically, both students and teachers can identify during their performance or discourse topics of interest or issues which amaze them. Other group members will alter or define the ideas based on their own interest once they hold the attention of the students. The ideas will inspire more study and analysis when they linger over time. Teachers formulate the concepts in a certain style which under the accepted umbrella of subjects preferred based on student curiosity and passion; the students are made acquainted to significant fundamental views and profound reasoning.

   Basically, ‘fostering communities of learning’ recognizes these foundations of learning by harmonizing the tasks of students-as-learners and students-as-teachers along with peer-teaching, mix-age tutoring, and approaches like the supposed jigsaw puzzles (refer box 1). The objective of these practices is that students develop as self-reflective, strategic researchers and exercise credible argu-

ment, clarification, comparison and comprehension-monitoring during alternate tutoring. Also, that student grows into co-investigators of their own study. The study which the students undertake is proposed to establish a broad disciplinary sense.

Box 1 Jigsaw in the Community of Learners

One of the 'fostering communities of learning' methods intended to make students designers of their own learning is a modified version of the jigsaw puzzle (Aronson, 1978 in Brown & Campione, 1994). The authors describe it thus: "Students are assigned curriculum themes (e.g., changing [animal] populations), each divided into approximately five subtopics (e.g., extinct, endangered, artificial, assisted, and urbanized populations). Students form separate research groups, each assigned responsibility for one of the subtopics. These research groups prepare teaching materials […]. Then, the students regroup into reciprocal teaching seminars in which each student is expert in one subtopic, holding one-fifth of the information. Each fifth needs to be combined with the remaining fifths to make a whole unit. All children in a learning group are expert on one part of the material, teach it to others, and prepare questions for the test that all will take on the complete unit. It is important to note that all children are finally responsible for mastery of the entire theme, not just their fifth of the material."(Brown & Campione, 1994, pp.233-234)[2]

Fostering communities of learning allows students much space for exploration and respective majoring, yet simultaneously the teacher purposely guides exercises towards significant content and manages the curriculum. The teacher thus guarantees that important subject matter is disclosed, understood, and communicated while setting restrictions on what is covered. The course of study is spiral: it emphasizes several topics which are revisited few times over the course of studying and which are every time reviewed at progressively profound and perplexing degrees of perception and interpretation. Every revisit is founded on past occurrence and on the changeful ability base of the students. Students hold ownership of what they learn since they have the right to choose (sub-) units for study. At the start of new units, the class reviews what they already understand along with what they wish to discover. Later, students flip through preferred books to develop questions, which are organized in sub-units. Activities, therefore, expand as a result of the students' individual inquiries and enthusiasm. This is termed appropriation of ideas: the teacher appropriates students' spontaneous ideas and reassures them to deal with fundamental broad accepted principles. Thus, the students' everyday interest fuels sustained research (Brown & Campione, 1994).

Finally, 'fostering communities of learning' is constructivist techniques in which teachers assist the students uncover significant curricular theories bordered by the students' respective concepts and discussions. Learning routines focus on learning by exploration and examination, and notably highlight collaborative study, for instance, by alternate student-student teaching.

2.5.2 Learning by Design

This is an inquiry-based science learning plan with attention aiming at learning for the adaptable shift to new circumstances. It is founded on case-based reasoning theory which was grown earlier as a means to enforce computer programs that can deal with problems based on past happenings. Its computing designs of encrypting, recovery, and transformation proceedings in analogical interpretation also add insight into human understanding and specifically in the capacity of previous incidents when solving new difficulties which has caused the formation of guidelines for education. Such guidelines contain, for instance; the type of issues which students should resolve; approaches to handling complicated issues; and the types of thoughts that must be strengthened in the course of studying. (Van Den Broek. G; 2012).

The primary hypothesis of case-based reasoning is that the people who reason logically simply apply their individual experiences when they handle foreign or unclear data while dealing with difficulties. In these cases, those who reasons seek to think of past related experiences in order to find an approach of understanding the current situation. Earlier experiences can help forecast the results of probable resolutions and notify possible difficulties.

As far as case-based reasoning is concerned, past experiences are kept in the form of cases; valuable representations of situations experienced individually which contain information on the past case, the difficulty or aim then, the manner in which the case was managed, and the effects of that performance or resolution. New problems can be solved where cases are comprehensive and hold a complete evaluation of goal achievement. Particularly, cases are extremely informative if they define distinctively under which circumstances those who reasons carried out which act, and whether and how this action led to the desired outcome.

Furthermore, case-based reasoning accepts that problem-solving calls for an identical new situation or issue and applicable earlier experiences, which are encrypted in cases. At the time of this matching action, the details of the aspects of the situation are applied to explore into recollection and attempt to get cases that identify with the investigation. The result of this investigation for matches relies on the following aspects;

a) the abundance of the cases in memory (i.e., on how well and how thorough the person who reasons deciphered, expressed and documented the experiences in memory),

b) the abundance of the investigation (i.e., how well and how thorough the person who reasons understands the new incident to recognize what is significant about it), and

c) on how reliable the person who reasons is at identifying the new problem with past experiences.

Each of these features of case-based reasoning has precise connotations for education. Firstly, students require valuable cases to speculate because this advances the possibility which they can get past experiences that are identical to a current situation. The simple conclusion for education is that students should be aroused to speculate seriously about numerous features of the theories and competencies they grasp. Ideas should be looked at from various standpoints, and faced in numerous situations so that learning is complex and flexible. This must bring about understandable interpretations of objectives of activities and the assessment of results.

Secondly, students should learn the way to expand on an assignment at hand to redefine and re-represent it in several circumstances and from a different angle. Considering a state of affair in a certain way enhances the outline of matters and by that will broaden the possibility that cases from memory are identified which matches a number of the typical features of the situation. An additional convenience is that expanding on the situation also brings about a deeper developing of it, which directs the recent situation itself into a valuable experience which the students can keep in mind and subsequently look to.

Thirdly, students should find out how to recognize similarities between an assignment at hand and previous experiences. This implicates the recovery of an identical case from memory; a method that is comparatively simple once the current situation is analogous to old experiences, however, can be more challenging if the match is uncertain. Therefore, students should exercise to recognize notable aspects of an issue, find out how to acknowledge if previous case or experience is appropriate, and determine how relevant theories are applied again and taken away in different situations.

More distinct academic principles which can be stemmed from case-based reasoning are: (Van Den Broek. G; 2012).

- Failure and helpful respond on failures are very valuable for learning as they aim the students' attention to views which are demanding for successful problem solving. Students require several opportunities to test their understanding and thereby receive straightforward feedback from experience. The investigation and interpretation of failure founded on feedback are essential to clarify their expertise considering the current experiences and develop the cases that the students keep in memory.

- Anticipating and considering the relevance of insight have a key function. Students must be inspired to recognize what lessons experience teaches, and to certainly connect what they have learned and in which context this might be applicable again. This will help them recall experiences in such a way which they can afterward rely on when dealing with new challenges. A commonly used technique to involve students in such type of thinking is allowing them to record their individual style and what they grasped from it for other students.

- It may be useful if students draw from records of others' experiences, specifically when they need the earlier know-how needed to take up a complicated assignment. Basically, this is usually performed with a case library that encloses case information written to assist the students to single out matters which need to be addressed.

Even though case-based reasoning advises which types of experiences and reasoning students need to have in order to learn intensely, it does not make detailed instructions for classroom exercises. Such detailed recommendations are part of instructional programs which were refined based on case-based reasoning, like learning by design.

Additionally, learning by design is founded on case-based reasoning concept and teaching styles from problem-based learning. The primary motive is that students take up a design challenge (e.g., a self-powered vehicle, an artificial lung, or a locker-organizer) which needs some significant insight or expertise to be mastered (e.g., Newton's laws of motion, the anatomy of the respiratory system). The design program creates an authoritative, purposeful framework where students study to make links with previous knowledge, ask questions, determine relevant insight, and learn and experience different scientific theories. Basis from case-based reasoning theory is utilized to pinpoint the types of an impression that presumably allow the students to recognize ideas and competencies and allow the students to apply ideas and skills to new challenges. (Van Den Broek. G; 2012).

Learning by design is a plan for middle school science classes. Models of its design-and-build objections are physical science groups asking students to style and build a parachute (to find out about combining forces), or to design and build a miniature automobile which can travel over various hills (to understand forces and motion). This kind of projects is competent with the specifications from case-based reasoning; the design method includes research, planning, and design, bringing valuable study experiences with structure failures as chances to review and amend concepts. The students' will to design a functioning item helps to stimulate them to debate their conclusions, to learn about and contemplate on the design explanations of others, to find what else they need to learn, and to grasp the science theories that enable them to recommend better solutions. Learning by design holds a set of ritualized and series of activities which facilitate teachers and students broaden a culture of collective, inquiry-oriented, design-based learning and to prevent everyday implementation challenges.

In the classic series of activities, students start by facing a design challenge in a launcher group in which they can "mess around" with structure materials or components. Then, the teacher assists the students in whole-class discourse in articulating what they learned while messing about and to create, compare and contrast concepts for ways to solve the challenge. The group then determines which matters the students need to study more about. Small groups of students each examines one problem and present their discoveries to their classmates. Afterward, a different turn of practicing what was learned on the design project. Daily presentations and discourses trail each construction cycle and concentrate on what has experimented, what has been studied, and how to exercise what has been learnt. These presentations urge the students to put their opinions in order so that they can deliver definite interpretation, and inspire the students to exercise active listening to get an incentive for their individual project from the other students' suggestions. Much time is dedicated to evaluating and clarifying why specific techniques did not work as anticipated, and to spot what else needs to be studied. (Van Den Broek. G; 2012).

Box 2 Dealing with common implementation problems

Learning by Design materials address common practical problems with the implementation of the programme in new classes. For example, many teachers initially find it difficult to reserve enough time for discussions and evaluations, and instead devote too much time to construction activities. As a consequence, there is a danger that the projects turn into arts and craft activities with little connection to the underlying scientific concepts. Several different solutions have been developed for such implementation problems.

First, there are worked-out teaching units, beginning with a launcher unit that introduce students and teachers to project-based work forms by means of a series of short challenges that can be completed in a few class periods. Other materials provide ideas for more advanced design projects with a choice of topics that are suitable for inquiry-based learning because they benefit from understanding of key science concepts.

Second, there is emphasis in all units on establishing routines for regular iteration moments and group discussions in which the rationale of design choices is articulated, evaluated and explicitly linked to scientific concepts. To support this, teacher materials specify learning objectives of each activity and provide advice about dealing with possible difficulties.

Third, instead of constructing a complete artefact, the design task can be to improve an existing one. This limits the time spent constructing, and directs the students attention to understanding why certain characteristics of the design-object are crucial for its function.

Fourth, for optimal documentation and assessment of individual student's performance during the design group work, a variety of design diaries, portfolio's and records have been developed in which the students can prepare the group work, document and reflect on what they did and learned, and write about their group experience.[3]

Generally, as explained in box 2, the case-based reasoning model portrays how students apply past experiences while studying and solving a problem, and focuses on how learning exercises should be arranged so that students can best count on them in the future. Values of case-based reasoning are put into use in learning by design projects.

2.5.3 [The Neo-Piagetian] Central Conceptual Structures (CCS)

This theory by Case outlines developmental transformation in students' thinking in various cognitive realms, like students' knowledge of numbers, distance, and descriptions. Such is a Neo-Piagetian theory, i.e., a theory which includes aspects of Jean Piaget's now typical account of students' cognitive progress. Like Piaget, Case hypothesized development as advancement through distinct phases and understood students' thinking as an interpretation of their evolving mental structures. According to central conceptual structures notion, the shift from one developmental phase to the next is restricted by the biological growth of the brain, more specifically, by the growth of brain structures for working memory which controls mental processing promptness. Still, the cognitive alteration is at the same time to a significant degree affected and motivated by experiences.

What types of experience spur cognitive development? Piaget (and also Case) presumed that humans are driven to fathom the world and to alter their way of reasoning if they cannot adapt new circumstances. This is known as disequilibrium: a state in which the present way of assessment cannot illustrate what the student experiences. Disequilibrium stimulates students to adjust their cognitive frameworks. Instances of this kind of cognitive adjustments are the incorporation of various thoughts or the variation of features of one impression, and overall the drive toward a more composite phase of development. These Piagetian concepts have affected learning for years since they understood the part of the learner as that of someone who is enthusiastically developing and constructing his proficiency. This role of the student has stimulated numerous constructivists' teaching approaches in which students build up their understanding through research, diligent participation, and social relations. Nonetheless, there is more significance for educational training than just offering students an active part. (Van Den Broek. G; 2012). New implications are:

- The students' present degree of understanding should be accepted as a foundation to build on when presenting new concepts.
- The next degree of reasoning that trails the students' present understanding should be accepted to design graded series of exercises

that enable the students to shift from their present understanding to the next advanced level, creating progressively composite understandings.

- It is conducive to propose cognitive difference, for instance, by acknowledging limitations in student's ongoing ways of reasoning because disequilibrium influences students to create new understandings.

While these principles have been recognized by most educators nowadays, they are articulated in very theoretical terms which are challenging to put into practice. Central conceptual structures theory is more manageable in this regard than the earliest theory by Piaget as it makes forecasts about the character of transforming cognitive structures in detailed content-domains like statistics, space, and narrations.

Case named these conceptual structures Central Conceptual Structures (CCS), and defined them as "networks of semantic nodes and relations"[4] which clarifies students' key knowledge. He believed that central conceptual structures change during advancement from straightforward to more and more complicated forms and impact knowledge acquisition by creating higher restrictions of the student's processing capabilities. More precisely, he identified four key phases of thought, each with various small sub-phases. Each key phase alteration includes the hierarchic incorporation of two components of thoughts which were previously merely obtainable individually, whereas sub-phase changes include growing explanations of this new component. For instance, at about four years old, children are believed to possess two knowledge systems in the number domain; one to carry out global quantity evaluations (which stack of cookies is larger?) and the other to count small sets of items (How many cookies are there?). Nevertheless, 4-year-olds cannot apply these two systems at the same time. This implies that, for instance, they do not count the components of two stacks to find out which one is larger. At about age five to six, a big development happens when the two "precursor" structures become combined into one single structure, the basic numerical structure (also known as number line), in which figures are conceptualized as a systematic sequence of words which are connected to quantities. Children start to realize that some quantities are greater than others and progressively understand that numbers possess a magnitude (e.g., "9 is bigger than 7!"). This allows them to appreciate that addition and subtraction problems can be solved by calculating forward or backward. (Van Den Broek. G; 2012).

What are the educational effects of such explanations of development? Basically, series of central conceptual knowledge structures outline which concepts are central to performance. These can be communicated, particularly to children who may not have chances to obtain them on their own. Secondly, classifications classify how children naturally construct their understanding at different age levels, so that teachers can evaluate students' present level of knowledge to find the ability that should be taught next. Methods have already been established to measure children's level

of reasoning in some content areas and research recommend that students can certainly attain a deeper realization if the curriculum concentrates on a step-by-step teaching of a conceptual structure.

Overall, central conceptual structures propose that instructional plans should aim attention at knowledge which is the key to knowledgeable performance, and utilize designs of the way in which students naturally construct knowledge during the course of development. Teaching should bear in mind that some students may not have known the essential normal experiences to deepen vital central conceptual structures, and should count on the precursor methods of understanding which students establish at earlier ages.

2.5.4 Web-based Inquiry Science Environment (WISE)

Students contend with different, inconsistent, and frequently puzzling concepts though they learn scientific theories. Teachers can apply these concepts as an initial point and plan the learning process as one in which students embrace new thoughts, iron out wrong ideas, draw up connections among ideas, improve measures to assess ideas, and create comprehensible collections of ideas. This process has been known as knowledge integration, and the knowledge integration structure is the base of Web-based Inquiry Science Environment (WISE).

The knowledge integration standpoint is established on two properties. Firstly, students take to science class various contradictory interpretations of scientific phenomena, frequently related to particular contexts, cases, experiences, or circumstances. Then, students purposely improve their repertoire of opinions about the scientific phenomena and capitalize mental strength to analyze, identify, link, criticize, and formulate their ideas. This energy which students bring to science is the foundation to better scientific understanding and make scientific rational a lifelong procedure. Teaching should evoke student thoughts, enhance promising normative concepts, and uphold the process of merging, arranging, generating, and demonstrating to develop understanding. (Van Den Broek. G; 2012).

Linn (2006) differentiates among four chief paths which students usually pursue as they create and adjust their set of ideas:

- Firstly, some students are likely to conceptualize - they begin with a wide range of ideas but swiftly aim their attention at normative ideas. They frequently disregard the sources of their initial understandings, and willingly accept theoretical ideologies from instructional resources.

- Secondly, some students are likely to experiment - they assess and alter their (various) thoughts in several contexts, including both normative and non-normative concepts to describe interpretations and master everyday experiences. These students notice interesting contexts.

- Thirdly, some students strategize - they divide the school perspective from other contexts and try to attain good outcome with least work, usually banking on repetition learning and seeking to determine methods to solve questions that are possible to appear on the test.

- Fourthly, there are students who contextualize concepts, that is, they look at all ideas in confined specific contexts rather seeking links. This restricts their justifications, for instance, when they decide to debate that two features of one opinion are separate (e.g., heating and cooling).

To review, students integrate proof from authentic reports, the researches they conduct themselves, and convincing messages in various ways. Still, they frequently need standards for differentiating ideas or assessing the consistency of their notions. Thus, teaching should allow students to better resolve their ideas and to improve principles to interpret ideas so that they can construct comprehensible interpretations of scientific phenomena.

Early knowledge integration studies exposed four methods in which teaching can stimulate knowledge integration in this approach: (Van Den Broek. G; 2012).

- Teaching must make science available. This is to promote that students can reorganize, reconsider, connect, criticize, and evaluate both the fresh ideas and their conventional observations. Making science available implies planning science composition, however not necessarily reducing the language or subject. It starts with the option of a reliable survey question, which should not be too extensive but prompt students to learn choices and trade-offs. Then, students might need a push to get started, for instance, by pursuing accurate stages for the initial analysis examination and then less complicated steps in following projects. Whenever likely, assignments should tie to personally significant, composite questions and offer students with experiences which support them adjust their scientific thoughts.

- Teaching should make reasoning evident. This concerns the reasoning of both the teachers and students. The teacher should design scientific thinking to assist students comprehend how problems are resolved, for instance, according to simulations and visualizations. The students should be encouraged to describe their ideas, criticize and evaluate their improvement, and reveal the character of science.

- Teaching should allow students to acquire information from others. When students grasp from each other they come upon a wide range of understandings which help them improve personal standards for decisions, and make their resolutions understandable to others.

- Teaching should stimulate independence and lifelong knowledge by involving students in difficult projects in which they exercise criticizing, analyzing, reviewing, reconsidering, and revising their ideas. This supports them to compare solutions, test possible links, and explain novel, composite problems.

To verify these knowledge integration views with more subjects, teachers, and perspectives, WISE was established in collaboration between academics, classroom teachers, and scientists. WISE is an Internet-based platform for middle and high school science undertakings where students work collectively on survey projects, utilizing data from the web. These projects can continue from two days to four weeks, and usually involve students in either planning solutions to problems, arguing contemporary science controversies, or criticizing scientific assertions found in websites. WISE projects are shaped by design teams that consist of teachers, scientists, pedagogy academics, curriculum designers, as well as specialists from science agencies and museums. For instance, in the course of one project planned in partnership with NASA, fourth and fifth graders design a terrarium to contrast the growth of NASA fast plants with normal earth plants. Every project is proven comprehensively to find out what ways the project design systems stimulate knowledge integration, later revised by WISE researchers and reviewed respectively. The most effective projects come to be part of an online library. (Van Den Broek. G; 2012).

As outlined in box 3, WISE programs direct students with a query map and practice fixed evaluations. The inquiry map steers students to coherent their thoughts, assess forecasts, reveal their improvement, observe and give comment on each other's work. This allows the students to work individually, without a need for continuous teacher supervision. Teachers can see student thoughts online in actual time and adopt them to modify teaching to their students' needs. The intention of the modules is to encourage students act as scientists, measuring standpoints, developing criteria for rewarding ideas, articulating arguments, gathering proof for their individual opinions, and analyzing disputes created by their peers. They consist of design instructions for teachers to construct a lesson plan around the WISE project.

Plan studies by means of WISE projects have cultured recognition of knowledge integration procedures and caused the finding of four connected processes that cooperatively bring about integrated understanding:

- Provoking existing ideas: a teaching which elicits present ideas in diverse contexts motivates students to set up links and networks among their thoughts, instead of separating ideas in one framework.

- Boosting new ideas: adding innovative, normative ideas can also bring about knowledge integration. Teachers need to guarantee that students do not only add different ideas to current concepts, but incorporate them into comprehensible mental formations. This is more probable to occur when new concepts make evaluations be-

tween situations, impact available contexts like every day experiences, give criticism and inspire students to form narrative explanation of their thoughts.

- Evaluating ideas: measures to assess ideas are significant as they allow the students to seriously evaluate data from various sources, for instance, from the websites and well-known publications.

- Sorting out ideas: students must learn to identify or straighten out incorrect ideas.

Box 3 Design patterns for teacher and learner activities that emphasize knowledge integration (Linn et al, 2006)

Orient, diagnose, and guide: define the scope of topics, connect them to personally relevant problems, link to prior instruction, identify students' entering ideas, and add other ideas to stimulate knowledge integration.

Predict, observe, and explain: recursively elicit student ideas about a topic, demonstrate phenomena and ask students to reconcile contradictions.

Illustrate ideas: model authentic reasoning, make strategies visible, let students try out strategies and reflect on their views.

Experiment: students frame questions, generate methods for investigation, carry out investigations, evaluate, use findings to sort out ideas.

Explore a simulation or create an artefact: framing challenge or contest, test with a simulation or creation of draft artefact, evaluate results, refine solution, and connect results to views on topic.

Construct an argument: select question, generate ideas, identify evidence, articulate viewpoint, revise viewpoint based on feedback.

Critique: evaluate ideas about scientific phenomena, formulate and apply criteria

Collaborate: generate ideas, negotiate meaning, respond to group ideas, support views, reach consensus.

Reflect: analyze the connections made between their ideas, monitor own understanding.[5]

Altogether, WISE is an internet-based flexible learning setting in which values of knowledge integration are put into practice in the course of online collective science examinations. Knowledge integration deals with processes by which students integrate and coordinate scientific concepts.

2.5.5 Cognitive Tutors

One-to-one tutoring is frequently more practical than whole-group classroom teachings, however for economic rationale; it is merely seldom likely to equip every student with separate instruction. Progressively, computers generate conveniences for individual electronic teaching: up-to-date computer programs are responsive and can accommodate and foresee the wishes of the user. This responsiveness is used in advanced software which encourages students by giving separate comment and on-the-task suggestions or alterations and adjusts the complication of exercises to the ability level of the user. Such smart computer tutor techniques have been practiced in learning, particularly in disciplines like science, technology, and mathematics.

One illustration of a research-based method to the use of electronic instructors is Cognitive Tutors, a word which defines a range of programs which had been applied by almost half a million US students already by the mid-2000s and which concentrate on subjects such as algebra, geometry, or computer programming. The goal of these programs is to design teaching with regards to a cognitive model of the capability which the students learn. These models are founded on Adaptive Control of Thought-Rational (ACT-R) theory; a concept of learning and performance which characterizes the structure of the brain to describe human reasoning.

ACT-R designs speculate that capability breaks up into a set of rules and that learning signifies gradually obtaining these supposed “production rules”. Production rules serve as mental networks between internal objectives or external duties and reactions; they are an imperative component of ACT-R designs and describe how students speculate or reason. The difficulty of capability is considered as controlled by the set of production rules which need to be learned to grasp the skill. Additionally, most areas also need the acquisition of some descriptive information, however, this is considered as comparatively problem-free. On the other hand, the acquisition of the procedural knowledge which allows the students to practice declarative knowledge in real actions is regarded more challenging, and it demands enthusiastic engagement of the student in a problem-solving exercise. The intention of cognitive tutors is formerly crucial to offer the students such practice. The efficiency of this practice rests on the way in which students participate in exercises and the way in which they experience them. As much as possible, teaching is located in authoritative duties and the end structure of problems is made unambiguous to aid students comprehend how problems break up into successive sub-goals. (Van Den Broek. G; 2012).

Software grounded on ACT-R utilizes itemized models of the continuing acquisition and variation of production leads over time. These models are specially intended for each instructed proficiency domain and define learning tracks as containing consecutive sub-goals which are answered by putting into use relevant production guidelines. For instance, when the assignment in geometry class is to verify that two triangles are congruent, the initial sub-goal in the explanation path is to show that corresponding portions of the triangles are congruent. ACT-R models take into consid-

eration that there are regularly diverse techniques in which students can obtain the same idea or knowledge and also take in information on various incorrect ways that students often follow at particular points in learning. For instance, the software can identify errors which are possible because of an excessively general use of production rules in circumstances different from those in which they were learned and then provide feedback directed to this mistake so that students can right their performance and return to one of the more rewarding learning paths. If students inquire for assistance, clues are presented which direct the student to the next subgoal. (Van Den Broek. G; 2012).

Cognitive Tutor software constantly observes student performance and guesses the possibility that the performance is determined by specific goal production rules. In this development, the software seeks to identify the student's plans by matching the observed student performance to tracks of cognitive activities from its library. This process is known as model-tracing, since the student's performance is in line with cognitive models. Given a match, the instructing system can offer real-time instruction distinguished to where the student is in the problem. If the student provides correct answers, the tutor does not comment and enables the student to advance, but once the student pauses, a clue can be provided. If the student makes an error, the program gives a response to guide the student back to the right solution track. Particularly, if the error matches a common incorrect production rule, a response message is shown to right that particular mistake. Moreover, guesses about the student's understanding of various production rules are also applied to decide when to continue to new topics or problems.

Box 4 ACT-R theory about Learning by doing

According to ACT-R, human cognition emerges through an interaction of procedural memory and declarative memory (Anderson, John, et al., 1995). Declarative knowledge corresponds to explicit verbal information or images that we are aware of and can describe to others (e.g., "Paris is the capital of France"). In contrast, procedural knowledge describes implicit knowledge about how to do something, which is knowledge that we display in our behavior but are not conscious of (e.g., being able to apply a certain mathematical rule). Importantly, ACT-R predicts that performance knowledge can only be acquired by doing (Koedinger & Corbett, 2006). It cannot be learned passively by listening or observing, but must be induced from constructive problem-solving experiences. Only then can internal cues like personal goals or external cues, like tasks presented by the teacher, become associated with the correct responses in production rules. ACT-R furthermore assumes that declarative and procedural knowledge acquires strength with practice. Thus, even after successful encoding, further practice is important and useful (Anderson, Corbett, Koedinger, & Pelletier, 1995).[6]

Thus, as illustrated in box 4, cognitive tutors are smart software programs which offer students with a framework, feedback, and support, adjusted to the individual students' requirements. The programs are founded on models of classic learning trajectories and typical misunderstandings, which define learning paths of consecutive sub-goals and production rules. By measuring student performance to common learning paths, responses can be explained and rectified with appropriate feedback.

2.5.6 Direct Instructions

The term 'direct instruction' refers to a teaching plan aimed to expand and quicken learning through coherent and concise direct contact by the teacher and extraordinary rates of student success throughout extensive guided, sequenced exercise. (Note that the capitalized term "Direct Instruction" refers to a specific educational program, which is different from the more general use of the term to refer to all kinds of explicit teaching using lectures or demonstrations and frequently contrasted with more exploratory or inquiry-based learning).[7] Direct instruction has been improved during the last 40 years. The technique has constantly been proved to develop different learning results including reading and mathematics, yet it is contentious and frequently tolerated skepticism because of its authoritarian nature and the determined role of the teacher.

The key presumptions of Direct Instruction are:

1. All students can alter information which is provided to them and abstract "features" from illustrations.
2. Students generalize on the basis of similarities of features of various illustrations in a logical approach.
3. What students study is persistent with the teaching they receive.
4. Students' memory and feature-abstraction competence develop with exercises.

Now, with these principles, it was supposed that in order for students to absorb a concept, information need to be offered in a coherent and persistent manner. Concurrently, if learning becomes unsuccessful, this is highly possible because of an inadequate accuracy of teaching and exercise. Thus, direct instruction teaching possesses the determination to guarantee precise communication and an ideal choice of examples throughout teaching.

Additionally, direct instruction teaching approaches can be distinguished by three key factors:

- The content is structured around widely relevant general concepts and strategies, which are explicitly taught after attentively scheduled series of lessons which are organized based on values of coherent communication.

- Direct instruction delivers strategies for effective organization of education, this includes grouping based on a comparable level of student performance, regular assessment, and effective use of teaching time through comprehensive and explicit articles for the teachers.

- Direct instruction offers particular plans for student-teacher communications which eagerly involve all students and let the teacher keep a close eye on the students' improvement, like choral answering.

Moreover, the capacity of Direct Instruction is structured around comprehensive concepts and skills which allow students to later excel the matters taught and put into use their learning in new situations. This comprises of elementary skills and higher-order reasoning skills, like cognitive plans to resolve difficulties. The order in which skills are taught is designed in such a manner that students consistently have the compulsory prerequisite abilities for each phase and retain a high level of success during practice. This is also known as teaching to mastery. Normally, simple (prerequisite) skills are taught earlier than the more challenging ones, and classic examples are practiced before special cases are introduced. Also, lessons are prepared with records, which are series of activities to teach an individual skill across various lessons. Each lesson contains activities from different records, and skills improve progressively over the course of multiple lessons. The intention of this organization of studying is to guarantee that information is combined across lessons and that students do not forget or mix up old skills when a new unit starts. (Van Den Broek. G; 2012).

Direct instruction layouts indicate exactly how teachers should give examples, and which interpretation, questions, and alterations they should apply. The goal of these layouts is to push teachers to be clear and succinct as well as benefiting the students to aim their attention on the relevant features of resources. For instance, there are plans for the preferred examples - how to determine the differences between examples and non-examples in an explicit method, the phrasing of descriptions - teachers should use the same phrasing on all matters since variation might spawn confusion, and mistake alterations - teachers should perfect the correct answer, check if the student can reiterate it, offer further practice, and test the original item again following a delay.

In addition, teaching with direct instruction is primarily extremely supportive and organized to guarantee a high rate of student success in the course of learning: teachers display first-hand skills and deliver very unambiguous instruction, using basic contexts, and persuasively direct students' focus to relevant points of the problem. Then formats steadily change to allow students exercise their skills more individually and in more and more complex situation. Like, following first clearly revealing the steps of problem-solving audibly, students progressively learn to do them "in their head". Throughout learning, the considerable practice which is initially used to gain a new skill is substituted by assigned exer-

cise over lengthy periods of time to assure retention of skills, and assessment is increasingly deferred to make more natural cases.

Now, in the course of direct instruction, students perform in small groups of comparable competence levels. Arrangements are flexible, and can vary for each subject, and groupings can also alter through the academic year depending on different improvement levels. For instance, students who learn quickly can move to more advanced groups. If required, teachers use placement tests to create groups. The capacity of learning is constantly somewhat above the students' present competence level, in order that they possess the imperative prerequisite skills to grasp the learning objectives. Also, on-going evaluation is a crucial aspect of direct instruction, and it contains both the purpose to give feedback on the efficiency of teaching and to deliver an assessment of each student's development. Results from tests are used to create and alter student groups, to influence the pace of teaching, and to recognize areas which need extra practice.

Therefore, to utilize instructional time efficiently, teachers are required to make switches between activities smooth, have resources at hand, and improve effective learning practices for their classrooms. Direct instruction resources contain comprehensive texts with explanations, cases, and terminologies for each lesson, to ease teachers of the burden for planning and analyzing each lesson on their own. The teacher's task when applying these texts is defined as that of an "actor" who emphases on giving instruction, amending it to the needs of different students, and solving unanticipated issues, yet does not have to create himself a visibly scripted curriculum. (Van Den Broek. G; 2012).

Teacher-student communications in direct instruction are intended to boost the time which students interact with instructional resources and get relevant feedback. The logic supporting this is that the more active responses each student can deliver, the more learning can occur, and the less probable students are to be confused or reveal behavioral problems. Moreover, teachers can well observe their students' performance in the course of active practice. One often-used technique concerning this purpose is choral answering with a signal system. Generally, this includes a signal system in which the teacher asks a question, allows the students chance to think, and then give a cue so that the students reply in unison "on signal".

In brief, direct instruction is based on distinctly defined and unambiguously scripted teaching processes which were intended to encourage coherent and explicit communication, and to participate all students in active exercise with a high level of success and the least amount of mistakes.

2.5.7 Higher Order Thinking Skills (HOTS)

Higher-Order-Thinking-Skills (which will be referred to as HOTS here on) is a compensatory curriculum for academically disadvantaged students in grades 4 to 8 which develops common thinking skills by way of Socratic dialogues. It was devised by Stanley Pogrow, a professor from the University of San Francisco, and has been enforced in various American schools since 1983. During everyday pull-out lessons, small groups of students and a qualified teacher participate in stimulating discourses around intricate puzzles displayed on the computer. The method is based on the theory that reasoning obligations of content-learning advance intensely following grade 3 so that students who need practicing of sophisticated thinking with a knowledge of understanding unavoidably fall behind. (Van Den Broek. G; 2012).

Basically, the drive of HOTS is to support these students cultivate sophisticated thinking skills in order that they can well follow normal classes. One of the main principles of HOTS is that most students lag behind not because they are not intelligent enough but rather they do not have the socio-cultural encounters which cultivate meta-cognitive skills, for instance, because their parents do not involve them in argumentative dialogues which are needed to grow complex reasoning skills. Consequently, the emphasis of the compensatory teaching activities is to offer the children considerable exercise in complicated thinking, to push them to express reasoning procedures and to motivate them to realize how strategic thinking brings on effective problem-solving.

Also, HOTS is based on the notion that the ultimate difficulty for disadvantaged students is an incapability to create the kinds of perception essential to handle challenging curricular ideas. For instance, they do not know how to manage more than one idea at a time, how to deal with uncertainty or how to engage in a conversation about concepts. The purpose of the HOTS program is to progress these types of common problem-solving skills which allow students to better comprehend what they are taught in daily classes. The theories which are considered in HOTS classes are logically challenging in order that the students learn to persevere and get to face the fulfilment of achieving a goal after working to achieve it.

Now, over the course of the lessons, the teacher directs dialogues in such a way which the students run-through important cognitive reasoning skills when they clear up ambiguity, create meanings, and articulate sophisticated concepts and strategies.

Explicitly, the HOTS program was devised to develop the following accepted reasoning skills:

- Meta-cognition; described as the ability to improve, purposely determine, practice, prove and articulate approaches to resolve problems.

- Interpretation of information from a situation, such as determining the significance of data or unfamiliar words from context.

- De-contextualization; the expertise to simplify or pass on what was grasped in one context to different situations and questions.

- Synthesis of information; joining data from various sources and recognizing those bits of data which are relevant to resolve an issue.

A specific HOTS curriculum was established which utilize these skills in Socratic conversations, alongside the primary plan to use software which attracts the students, like, games and adventure stories, and a sequence of questions which deliver exercise in the higher thinking skills. For instance, to encourage meta-cognition, students are examined during problem-solving tasks to explain which strategy they work with, how they select their strategies, which strategies fail to work, how they can know that a strategy does not perform, and to produce predictions about strategies which might be useful. (Van Den Broek. G; 2012).

Furthermore, inference from context is introduced in several ways, for instance, by allowing students read exciting stories which contain words in important places which students do not comprehend. Students make suggestions about the definition of these words, and then study and figure out their guesses in discussions with the teacher. These discussions pose the types of prediction which good readers impulsively absorb in through reading comprehension. In order to boost de-contextualization, sequences of ideas are examined through many diverse contexts and students are urged to illustrate how the application of concepts is similar and different in numerous problems. Such continuous discourse of connections between various portions of the curriculum delivers effective exercise in simplifying concepts.

Then, the synthesis of information is experienced when students integrate data from a mixture of sources, or numerous dissimilar kinds of information, to solve questions. The extent of information which students need to gain, decipher, and acknowledge in order to strengthen successful strategies is expanded during practice, and in some units students are intentionally overloaded with information to confirm the need for outlining and prepared note taking.

HOTS is a pull out program intended for small groups of ten to twelve students who perform with a specially qualified teacher. The groups gather for 35 minutes per day, four days a week, through one to two years. During the first part of each lesson, the teacher involves the group in complex Socratic conversations. The target of these dialogues is to encourage the students to become progressively comfortable articulating sophisticated concepts and to adopt language in a social situation in more and more practical ways. Later, in the second part, the students try to resolve a challenge on the computer (refer box 5). The tests are visually stimulating and encouraging to students, yet created in such a manner which main parts of information are omitted or beyond the students' current understanding. This generates a springboard for student considerations, predictions and debates. The activities are intended to be so challenging that the students

would fail at first, but will become outstanding when they persist to attentively handle their views.

Although software is utilized to push students, the vital factor of the HOTS program is the dialogue between students and teachers. The software permits students to openly assess their thoughts before expressing them, still, nearly all learning through HOTS lessons develops not from the handling of the software rather from the comprehension-monitoring, context interpretation and articulation tasks exercised in the teacher-student conversation. During the HOTS lessons, teachers ask the students to express their views, discourse their answers and methods, and clarify how and why the computer is reacting to their approaches in a specific manner. Students are constantly reassured to analyze their strategies and to make guesses what will come about when they make a particular choice, in order to raise the complexity of their language in terms of comprehension and diction. (Van Den Broek. G; 2012).

Box 5 Making Problems Intriguing: The Word Problem Processor

The puzzles that students work with during HOTS lessons are chosen to be intriguing and motivating for students. Instead of trying to link problems to (adult) real-life, puzzles are often designed around student fantasy and settings of adventure and exploration (Pogrow, 1994). The Word Problem Processor is one example of such a program, in which students interact with a virtual space creature. This programme is part of Supermath, a content-oriented curriculum that was developed as part of the HOTS project (Pogrow, 1995, p.64). The scenario of the World Problem Processor is that the students communicate with a space creature inside their computer. This creature understands English and speaks math. The students write stories to entertain the creature and the creature provides a mathematical solution if the story is clear and not too simple to allow it to speak math. If the creature cannot understand the story, it tells the students why, so that they can revise their story. By constantly trying to understand the creature's reactions, students begin to use comprehension strategies to solve problems. This is combined with ongoing conversations between teachers and students to help the students think about the general implications of the activity. The teachers consistently probe the students' answers for understanding, for example, by repeatedly asking the students to explain why the creature responded to their stories the way it did. Later, when students solve word problems themselves, they intuitively think of how the creature would have reacted. This helps them develop a mental model of how math and language go together.[8]

Therefore, there are certain HOTS workshops in which teachers study and run-through how to manage HOTS classes and inspire discussions which care for sophisticated thinking skills. For instance, they prepare to provide

follow-up questions which hold students in a reflection mode throughout the discussion. Instead of restating or intensifying student answers, teachers learn to probe students to speak loudly. The aim of these approaches is for students ultimately to contribute complex, whole answers on their own.

Finally, HOTS is a compensatory procedure in which students involve in Socratic conversation on notions and approaches to resolve game-based problems on the computer, which delivers students with comprehensive exercise in applying and articulating crucial accepted thinking skills like meta-cognition and inference making.

2.5.8 Knowledge Building

Knowledge building is a constructivist teaching method which purposes to reorganize education around objectives and procedures of knowledge generation. After the hypothesis which though attainments may vary, the development of knowledge building is comparable for children and adults, it involves learners of all ages in the complete course of knowledge building, which takes in shared cognitive duty for the improvement of knowledge.

Theoretically, the key difference between knowledge building and other styles of constructivist teaching in learning communities is its stress on the significance of concepts as items of examination and development in their respective right. Knowledge building seeks to create the move from students being learners and questioners to students being participants of a knowledge-building community. The central incentive of exercises is to recognize and raise the limits of knowledge and to develop thoughts which are of significance for the learning community. Students asking questions and working collectively to answer knowledge questions are the key idea of classroom activity, along with their hypothesizing, interpretation, recording, investigating and conversing all fixed to this purpose. Learning is considered as something which occurs simultaneously, as an internal, imperceptible action which brings about alterations of idea, mindset, or ability, while knowledge building, by comparison, brings about the formation or adjustment of public knowledge; knowledge which exists in the world and is obtainable to be operated on and adopted by other people. (Van Den Broek. G; 2012).

Additionally, Scardamalia and Bereiter maintain that this knowledge building exercises involves the same underlying learning of higher-order cognitive skills and cooperative constructivist analysis as other methods, nonetheless go above these by also familiarizing learners to developments of knowledge design: The significant difference is between learning – the method in which the fast developing cultural capital of a society is dispersed – and knowledge building – the premeditated attempt to boost the cultural capital of society.

Knowledge Building lessons take considerable advantage of a special software setting planned to integrate knowledge, the alleged Knowledge Forum. It is a discussion tool in which members encourage a community knowledge base by adding, adjusting and driving interrelated concepts,

which are defined in short text remarks, and graphical illustrations of chains of concepts or opinions. These opinions show how concepts incorporate, challenge, or limit each other, and the emphasis is equally on discovering the precise links between ideas and on achieving a wide standpoint which encloses ideas in greater conceptual frameworks. Such effective conceptual frameworks can deviate from learning goals which the students are required to work with (like, an outline of curriculum principles to which the students link appropriate notes) or be assembled by the students themselves when they probe to provide sense to selections of concepts. The software permits users to produce progressively great order conceptual structures, redefining problems at more intricate points and forming more comprehensive understandings. Members are stimulated to interpret, note, depend on or connect to other members' opinions in this practice, thus promoting a dominating point of view. Analysis and modifications are viable at any stage, with all members being involved in peer analysis and group editorial methods. (Van Den Broek. G; 2012).

Scardamalia (2002) characterized special aspects of knowledge building in twelve values, which are outlined below. It is grounded on values to influence pedagogy in a variety of perspectives, instead of a set of particular activity frameworks or processes.

- Real Ideas and Authentic Problems. One of the chief objectives of knowledge building methods is to cultivate in students a nature to work at concept enhancement, in order that issues are authentic and emerge from the learners' attempts to comprehend the world.

- Improvable ideas. All views are considered as improvable and members work constantly to better the quality, consistency, and usefulness of concepts. A necessity for this task is classroom knowledge of respect and trust, in order that members feel secure to specify incorrect thoughts, express half-baked ideas, and contribute and accept criticism.

- Idea diversity. The diversity of ideas is vital for knowledge innovation. To comprehend a notion implies understanding how it pertains to other views, including those which exist in contrast to it.

- Rise above. Inventive knowledge building involves performing toward prominent designs of problems and attaining innovative syntheses. Notions are regarded as items of analysis in their individual right, which collaborate with one another to create new and additional multifaceted concepts.

- Epistemic agency. Members handle challenges of objectives, incentive, assessment, and comprehensive preparation, propose their notions, and discuss an apt between their own and others' notions. Members realize that new improvements introduce new challenges and different possibilities for additional development, which moves education near to innovative knowledge performance at a professional standard.

- Community knowledge, collective responsibility. The goal is the cooperative establishment of public knowledge. Team participants present ideas of significance to others and divide responsibility for the general expansion of knowledge in the community. Inputs to shared targets are commended and awarded as much as individual accomplishments.

- Democratizing knowledge. All members are authentic contributors to the collective aims of the community; all take pleasure in knowledge progresses attained by the group.

- Symmetric knowledge and advancement. Expertise is shared within and between communities, emerging from knowledge interchange and co-construction of knowledge.

- Pervasive knowledge building. Knowledge building is not limited to certain events or matters rather pervade intellectual life; inside and outside of school.

- Effective uses of authoritative sources. Members are encouraged to utilize authentic sources, in addition to other information sources, as data for their individual knowledge-building and concept-advancing procedures. Such sources are regarded deferentially yet seriously and assessed against their input to the knowledge-building dialogue.

- Knowledge building discourse. The dialogue of knowledge is directed at idea advancement; hence it is devoted to improving, collective insight and a development of the knowledge foundation. It includes considerable sharing of knowledge with the intention of knowledge enhancement and transformation.

- Embedded and transformative assessment. Evaluation is part of the work to increase knowledge; it is practiced to recognize problems as the effort continues and is fixed in the daily activities of the organization. Principles and benchmarks are matters of discourse.

Fundamentally, knowledge building reorganizes teaching around objectives and procedures to produce and develop community knowledge through shared work. One mechanism for this drive is the software setting knowledge forum, in which members can present, construct, adjust, organize and combine ideas in writing or graphical form, to improve more and more complicated conceptual structures.

3 LEARNING ENVIRONMENT IN HAMK – VALKEAKOSKI UNIT

3.1 Current Learning Environment in HAMK – Valkeakoski Campus

As stated earlier, HAMK is an innovative institution organized with broad-based, high-quality learning. It is assumed that all the students who have attended and are currently attending are very pleased and satisfied with the institution's way of studying. This is because of its supportive staff members and conducive setting and resources which prompt students to complete their studies on time.

Now, in regards to the eight innovative methods of learning examined earlier in chapter 2, there are only four main innovative techniques which are necessarily practiced in HAMK – Valkeakoski campus. These four main innovative approaches are:

1. Fostering Communities of Learning
   HAMK is an international learning community which emphasizes free, research-based and student-focused instruction integrated toward the advancement of more leading knowledge through aggregated, authoritative assignments, collective research, and interdependent teaching. The international business faculty in Valkeakoski unit also embraces some parts of the *zone of proximal development* in its learning techniques. For example, HAMK agrees with Lev Vygotsky on practicing synergy with peers which is an effective learning technique for boosting competencies and strategies. Such teamwork and help would motivate a student within the *zone of proximal development* to complete a given assignment. Teachers help the students discover notable curricular philosophies surrounded by the students' own perspectives and arguments. Everyday learning concentrates on studying through research and analysis and particularly emphasizes cooperative study, like student-student tutoring. This causes students to become strategic researchers, self-reflective, as well as practicing authentic discussion, explanation, evaluation, and comprehension-monitoring in different tutoring.

2. Learning by Design
   This research-based learning program is somewhat evident in Valkeakoski unit in which it focuses on learning for a flexible shift to new situations. HAMK students who think logically simply use their own experiences when they deal with different or ambiguous data while solving problems. For example, students with work experiences can apply their knowledge while discovering a theory related to their experiences. Students also learn ways to develop an assignment at hand specifically to re-evaluate and re-represent in various situations and from a different direction. By developing the situation deeper, relevant experiences would surface which students can remember and later refer to. Also, students are able to determine similarities between the current assignment and earlier experiences.

3. Direct Instruction
   Everyday lessons in the international business faculty are conducted in a coherent and concise direct instruction by the teachers, and the four main presumptions of this technique are apparent with HAMK's learning environment. For instance, during contact lessons, teachers explain given assignments and make it clear to students about the details of the task and what is expected from the students in order to pass the course. Students clearly grasp concepts during the lessons due to the fact that information is offered in a coherent and persistent way. Teachers use ideal examples and precise communication while teaching using the three key distinguished factors of direct instruction.

4. Knowledge Building
   This constructivist teaching technique is practiced within HAMK's learning environment which includes the collaborative cognitive task to develop knowledge. It is visible in Valkeakoski campus that students are not just learners and questioners, rather they transform to becoming active participants of a knowledge-building community. For example, students are usually asked by the teachers to present their findings during class and participate in discussions to further study a concept. Daily classroom activities consist of students asking questions and working collectively, while teachers are increasing the limits of knowledge through lessons and assignments, at the same time promote significant concepts for the students.

Thus, it is fairly acceptable to believe that the international business faculty of HAMK, Valkeakoski campus, is on the right track of having an innovative learning environment.

3.2 Students' Perspectives on Valkeakoski's Current Learning Environment

Nevertheless, while doing surveys for this writing, it is apparent that some students feel quite differently towards HAMK, Valkeakoski Unit, being an innovative institution. The students' responses differ from various year groups which the survey questionnaires are handed to. The feedbacks are directed towards three key aspects of learning in the international business faculty of HAMK, Valkeakoski campus. These three key areas include; teaching technique, learning resources, and the general learning lifestyle.

Currently, though staffs of the international business faculty are helpful and inspiring, students also expressed their thoughts about few teachers who are considered incompetent in teaching which over time causes them to lack motivation and concentration. Most students responded with the dissatisfaction of the common practice of teachers having insufficient teaching skills and uninteresting style of delivering their lessons. It is almost always the norm in the international business faculty that teachers are less creative in their teaching technique. Like, they would usually read and teach from their prepared presentations without extra vivid illustrations to further clarify specific concepts. Lessons are normally delivered in a monotonous style which bore students and often leaving them less inspired. Additionally, students are also convinced that some of the interna-

tional business teachers frequently tend to be too enthusiastic about their respective courses, which cause them to require what seem like excessive performance and participation from the students. For example, the ongoing requirement for students to write learning diaries of all topics taught and studied during the entire course. With the existing demands from various important assignments, students argued that learning diaries are just too unduly stressed since it does not boost their innovative capacity to learn, rather they feel pressured and less motivated. Senior students claim that there are not many practical lessons which allow them to completely review and apply the various theories taught, while the new students, on the other hand, feel that HAMK is very innovative with inspiring teachers and ample practical lessons.

Now, with the feedbacks provided by the students from both groups, it is rather interesting to realize that they are not satisfied with some of the study resources available in Valkeakoski Campus. While a good number of students feel that the school library has insufficient English materials which limit their search for information, others feel slightly the opposite, stating that the school library is resourceful enough with helpful librarians as well as sufficient space and computers to work on. Dissatisfied students explained that international business faculty lacks innovative approach towards studying because of inadequate resources being available to students. The English materials provided in the school library are mostly course books which are basically not enough for further study and research. Another issue is the use of computers; there are only a few lessons which allow students to utilize the school's computers and software which, as a result, do not enhance students' interest and knowledge to apply specific technical theories into practice. These are the two main study resources which students insist on improving.

Moreover, more than half of the international business students in Valkeakoski campus asserted that the normal study lifestyle of the institution is rather monotonous and uninteresting. Learning situations in the international business program varies throughout each course, for example, there can be more practical lessons in one course compared to the other which assumed to ultimately give diverse approaches to the international business discipline as a whole. The lessons are also different in which there are daily classes conducted on the campus during the first year, and over the second and later years of study the days of contact lessons decreases. This is one of the few situations which drive each student from the two main groups of the survey to have different thoughts about the study lifestyle of HAMK – Valkeakoski Unit. Both groups of students have similar perspectives towards group work which is common in almost all the different courses. According to the students, there is often a shortcoming with group work which lessens an individual's ambition and effort to learn, mostly because they feel that their individual effort is not overtly recognized, instead it is constantly acknowledged as a group's effort. Group work is a typical learning tool in HAMK which aims to boost students' learning and stimulates teamwork, yet, it does not fully encourage an individual's academic growth due to the fact that only a few individual are working genuinely hard compared to others.

Still, generally, it is encouraging to learn that students appreciate the international atmosphere which HAMK has, mainly because they learn a lot of things from each other at the same time motivate them to do better in their studies. It is often, though challenging, interesting to work with other students from all over the world and study a concept in various aspects and approaches. Such interaction causes students to think outside of their normal mindsets and consider other brilliant notions while studying.

3.3 Students' Perspectives on Enhancing Innovation in Their Learning Environment

Interestingly, although students may have opposing views towards their current learning environment, it is pleasing to find out their concerns and various thoughts on how international business faculty in HAMK, Valkeakoski, could enhance its usual learning techniques and atmosphere. Even though HAMK is frequently considered as an innovative institution, the current students feel there is inadequate innovation in the three main areas mentioned earlier; teaching techniques, learning resources, and the learning lifestyle of international business faculty in Valkeakoski campus.

Firstly, HAMK should hire qualified and experienced individuals to teach the different courses based on both their teaching proficiencies and experiences. It is clearly evident in the international business faculty of HAMK that, if not all, some of the teachers are barely trained with only sufficient experiences with the subject matter. For example, the person perhaps has been working in a certain company as a manager and is hired by HAMK to teach a course which is assumed to be relevant to the person's experience and knowledge. The newly hired teacher may have extensive experiences about the course and its concepts yet would not be able to deliver the lessons and perform up to par. Teachers are supposed to be one of the most important motivators in each student's life which would drive them to be enthusiastic towards successfully achieving their academic goals. Therefore, when teachers lack adequate teaching skills, it causes students to be less motivated and less interested to being in school as well as completing their assignments and projects. Students believe that teachers need to be effective in their work; have a passion for the respective courses taught, inspire students to exploit ideas and deeply study the subject issue. Effective teachers without a doubt do enhance their students' learning.

Furthermore, there is a need to upgrade certain available resources in Valkeakoski campus such as the school library and utilize more the school computers. Students explained that the school library should get more English materials related to the different courses taught in HAMK and not just the main textbooks often used and recommended by teachers during lessons. While the normal procedure of borrowing books online from another library is helpful, it is sometimes quite inconvenient for the students, particularly when there is a delay. Also, not all students enjoy reading articles and books online since there are several distractions of trying to study online. So, the library needs to have at least a few hard copies of certain relevant e-books. Another innovative measure to enhance study is utilizing the school computers; there should be more hands-on lessons which allow students to efficiently utilize different computer software which are appli-

cable in the real business world. Computer software like Cesim simbrand (for marketing studies) while putting a strong emphasis on practicing SAP software in all appropriate courses as possible. Learning is more innovative when the concepts taught are understood but most importantly being practiced over and over again.

Thirdly, make room for more innovative programs and activities within the learning lifestyle of HAMK, Valkeakoski campus. While commending few other exciting academic events of international business faculty, it is also noticed that those alone do not fully keep students' motivation to become more innovative towards studies. This is mostly because of the fact that there are no practical supportive regular courses which maintain the inspiration in students. For this reason, HAMK should incorporate more relevant yet stimulating real-life situations into the various courses as tasks which would push students to seriously study the subject matter and determine the solutions. Also, prior reading about the next topic of a course should be encouraged and seriously considered throughout the entire study. For example, students should be encouraged to always read about certain concepts and topics before the actual lessons in which they would have some prior understanding and would grasp further details and examples later in the classroom. To add on to that, some courses are not at all necessary to be separately taught, rather it should be combined with another course which has similar concepts in order to avoid what seem like repeated assignment. As it has always been the custom of the international business faculty, group work plays an important part in its learning conducts. Nevertheless, according to most students, the emphasis on group work to some extent is overstated and redundant. The study style should have a balance between group work and individual work so that students can be genuinely assessed according to their individual performance as well as their contributions within their groups. This would prompt students to actively participate in class and at the same time deeply reflect on the areas of study particularly towards successfully achieving their academic goals.

With these three main aspects of learning in the international business faculty, students, for the most part, insisted that teachers need to be adept in teaching and be innovative in delivering their respective lessons. This would generally motivate students to be active learners which would cause them to become innovative towards their studies and academic achievements.

4 CONCLUSION

4.1 Brief Summary

The study was devised to determine ways in which the international business students of HAMK, Valkeakoski campus, could advance innovation in their studies especially following the changes in HAMK's curriculum and study structure. The study has also identified eight innovative methods to learning with which only four of them are relevant and are apparently practiced in HAMK, which brings about an exciting and favourable learning environment. The general theoretical information about this topic and particularly in the context of innovative learning within the international business faculty of HAMK is agreeable on several critical issues throughout the discussion. The study sought to answer the key question:

How to enhance innovation in studies?

4.2 Conclusion Drawn from the Study

Fundamentally, taking into account the four key innovative approaches to learning which is presently practiced in HAMK; *fostering communities of learning*, *learning by design*, *direct instruction*, *knowledge building*, along with the three crucial areas within the international business faculty which needs improvement; *teaching techniques*, *learning resources*, *learning lifestyle*, the institution need to critically review its learning approaches and environment at the same time allow for innovative techniques and processes, and properly implement them. HAMK should be responsive in hiring more skilful effective teachers who could inspire students and keep them motivated during the entire study period, give more practical lessons which are applicable in the real business world, and emphasize more on balancing the amount of group work and individual performance. In doing so, and by constantly reviewing its ongoing learning processes and its effectiveness on the students' performance, HAMK would be able to remain as an innovative institution.

4.3 Importance of the Study

HAMK recognizes the urgency of innovative learning within its international business faculty and sought to find out its various students' opinions on how to enhance innovation in their studies. Thus, the study is extremely relevant because it allows the institution to realize its current stand on the innovative learning path while simultaneously discover students' honest thoughts concerning its learning environment. The study is also important for researchers because it shed some light on HAMK's current learning situation as well as giving diverse responses from students about some vital changes which need implementing in order to boost innovation in the entire study process.

4.4 Recommendations for Future Research

The following suggestions are provided for further research on the subject of innovative learning:

1. Since educational institutions consist of teachers and students, it would be realistic to get responses from both parties to fully analyze the issues surrounding innovative learning.

2. Bear in mind students from different year groups often have different schedules, not to mention the amount of assignments they have, so be considerate when handing out questionnaires or ask for an interview. It is believed that people respond to things genuinely when there is less or no pressure at all while people with much pressure often respond merely on emotions.

3. It is only appropriate to do prior research about HAMK, its study processes, and curriculum, to really grasp the whole concept of innovative learning within its context and at the same time correctly identify areas which need more emphasis.

4.5 Limitations of the Study

The study has a few limitations in obtaining adequate responses to the survey questionnaires in pursuit to fulfilling its main objectives:

1. The study began quite late towards the end of spring semester, so the questionnaires were not given to all the targeted year groups of the international business faculty in Valkeakoski campus.

2. Email is still not a very persuasive medium of effectively communicating the survey questionnaires as there were fewer responses received compared to those which were handed out in person.

3. Responses were rather shallow in which they fail to completely answer the questionnaires as anticipated.

4.6 Final Remarks

After all the theoretical literature and discourses on enhancing innovation in studies, from the students' perspectives, it would be interesting to know how responsive the international business faculty of HAMK would approach the issue. Would the institution embrace the students' call for change within its learning processes in enhancing innovation? Keep in mind, success at innovation is not an activity of how much time and effort spent on research and development, rather on the quality of the process.

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Appendix 1

SURVEY QUESTIONNAIRES

These questionnaires serves to get useful and honest responses in completing the final thesis based on the topic ''Enhancing Innovation in Studies''.

Group: _____

1. Do you think that the current study technique in HAMK usually brings out your full innovative capacity to study? Either 'yes' or 'no', please explain.
2. Individually, how could you learn in a more innovative way while studying in HAMK?
3. How innovative are the teaching techniques?
4. Do you think that there are adequate supporting resources in HAMK which contribute towards innovative study? Either 'yes' or 'no', please explain.
5. Does being part of an international study group (like in IB, HAMK) motivate you to be innovative? Either 'yes' or 'no', please explain.
6. Do you think that HAMK - IB, is up-to-date with the modern technologies to improve innovation? Either 'yes' or 'no', please explain.
7. Some students are innovative in group work while others are more innovative on their own. What do you think? Why?
8. In light of innovation, do the recent changes in HAMK systems affect your studies? Either 'yes' or 'no', please explain.
9. Do your study demands affect you concerning being innovative? Either 'yes' or 'no', please explain.
10. What would you change in the IB (HAMK) system that would help you to be innovative during your studies?